Trend Study 16C-23-04

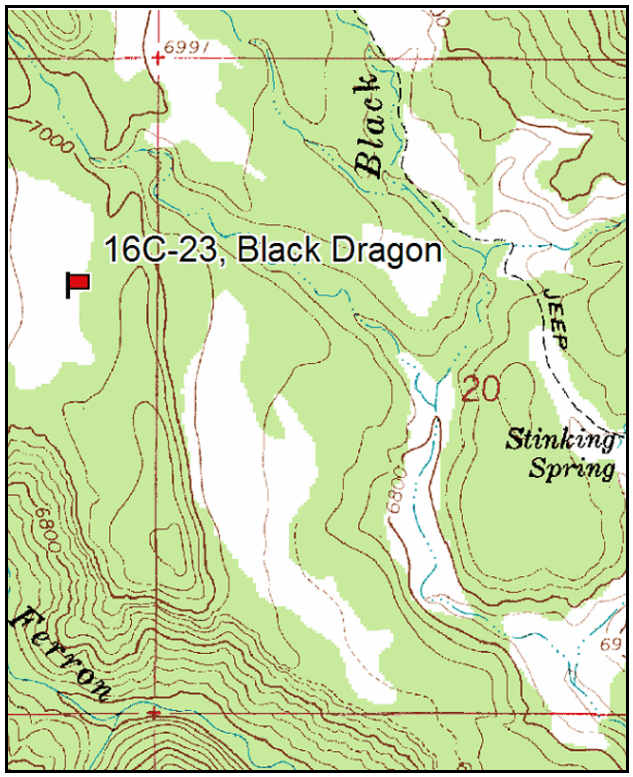
Study site name: Black Dragon . Vegetation type: Mountain Big Sagebrush .

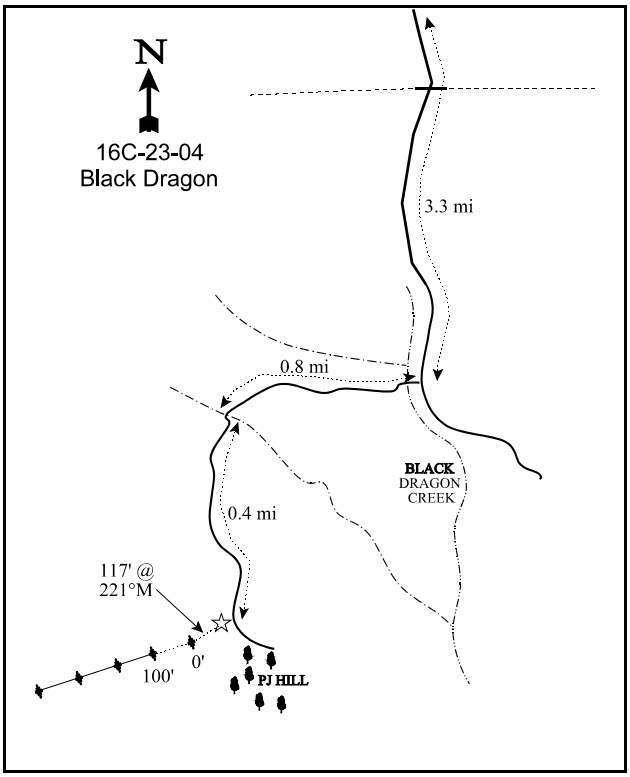
Compass bearing: frequency baseline 239 degrees magnetic.

Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft). No rebar on site to mark belt placement.

LOCATION DESCRIPTION

From the junction near the fence at the top of North Dragon Creek above Joes Valley, take the middle road (F.S. #170). Go down the Black Dragon trail 0.5 miles to a gate. Continue driving down the canyon 2.8 miles to a fork. Bear right across the creek. Proceed 0.8 miles through a chaining and down into a dry creek bottom. Cross and continue across a seeded sage flat for 0.4 miles to where the road turns to the left towards a P-J hill. There is a green fencepost on the right side of the road as a witness post. From the post, the 0-foot baseline stake is 117 feet bearing 221°, and is marked by tag #484.





Map Name: Ferron Canyon , Diagrammatic Sketch

Township l9S , Range 6E , Section 19 GPS: NAD 27, UTM 12S 4333919 N, 475543 E

DISCUSSION

Black Dragon - Trend Study No. 16C-23

The Black Dragon study site is located between Joe's Valley and Ferron Canyon. The Black Dragon area is important winter range for deer and increasingly important for elk. The pinyon-juniper type in the valley was chained and seeded. There are naturally open sagebrush flats, one of which was sampled by this trend study. The area was contour-trenched and seeded in 1965. It is now occupied by sagebrush and seeded grasses. The study site has an elevation of 7,000 feet with a slope of 5%. Drainage is generally south down Black Dragon Creek into Ferron Creek. On the study site, drainage is to the north and the aspect is more to the northeast. Like the two preceding studies, it is part of the Horn Mountain Allotment. Since it is a small unit, it is grazed by only a portion of the livestock in early spring. Use by cattle at the site is minimal due to lack of water in the area. Deer and elk appear to use the area moderately. Pellet group data from 1999 estimate 40 deer, 53 elk and 10 cow days use/acre (99 ddu/ha, 131 edu/ha, 25 cdu/ha) All of the cattle pats were from last season. Most of the elk and deer pellet groups were from winter, although a few of the elk pellet groups were from the spring. Pellet group data from 2004 estimated 17 deer, 50 elk and 11 cow days use/acre (43 ddu/ha, 124 edu/ha, 27 cdu/ha). All of the cattle pats were from last season, while most of deer and elk use was from winter. A few elk pellet groups were from early spring use.

The soil appears to moderately deep but strongly compacted, with a hardpan about 10-12 inches below the surface. The hard pan appears to be a calcium carbonate layer of cemented gravel. The soil is a fine-textured sandy clay loam with small gravel on the surface and within the profile. Parent material is a combination of limestone, sandstone, and quartz. The amount of phosphorus is marginal at 6.9 ppm and potassium is low at 60.8 ppm. Values less than 10 ppm for phosphorus and 70 ppm for potassium can limit normal plant growth and development. At intervals of 30 to 40 feet, there are contour-furrows which have effectively eliminated most problems from erosion. There is some bare soil exposed, especially on the top edges of the furrows, but generally there is adequate ground and vegetative cover. Between the evenly distributed shrubs and bunch grasses there are large patches of bare soil with a diffused covering of rocks and pavement. There is some localized erosion occurring, yet it is not serious due to the contour-furrows treatment.

A small statured mountain big sagebrush is the key browse species, most likely some hybridizing with black sagebrush. It provided 40% of the browse cover in 1994, 43% in 1999, and 60% in 2004. Density was extremely high in 1988 with an estimated 49,799 plants/acre, but 90% of these were very young plants. In 1994, there were 9,040 plants/acre estimated, 10,180 in 1999, and 8,900 in 2004. Young plants accounted for 28% of the population in 1994, increasing to 54% in 1999 and decreasing to only 5% in 2004. Utilization of the sagebrush has been increasingly heavy in the past with 74% of the sagebrush sampled displaying heavy use in 1999. Utilization has dropped from heavy to moderate use. Nevertheless, vigor is good and percent decadence is low at only 10% in 2004.

Another palatable browse species on the site consists of low growing winterfat. It showed moderate to heavy use in 1999 and heavy use in 2004. Its small size is typical for a high elevation ecotype even if it was not heavily utilized. The population is almost entirely mature with a few young. Rabbitbrush was the most abundant shrub on the site with an estimated density of 18,780 plants/acre in 1994, 19,680 in 1999, and has decreased to 6,520 plants/acre in 2004. This population has shifted from mostly young plants in 1988 to mostly mature plants by 2004. The number of dead plants has increased from only 20 plants/acre in 1999 to 1,220 plants/acre in 2004 or 12% are dead.

Herbaceous plants are moderately abundant. Crested wheatgrass provided 61% of grass cover in 1994 and now provides 88% of the grass cover. It is especially dense within the contour furrows. Native needle-and-thread, bluebunch wheatgrass, bottlebrush squirreltail, and Indian ricegrass have decreased and are only producing roughly 2% of the total cover. Forbs are rare, producing only 6% total cover and producing

little useful forage. The most common species include prickly phlox and scarlet globemallow.

1994 TREND ASSESSMENT

Percent bare ground has decreased, although due to drought litter has decreased as well. Most of the ground cover is provided by grasses and browse. Soil trend is stable at this time. Mountain big sagebrush shows an expanding population with 28% of the population consisting of young plants. Most of the sagebrush is lightly to moderately hedged. Percent decadency is low at 16%. Rabbitbrush also shows an expanding population with many of the young sampled in 1988 surviving to maturity by 1994. Browse trend is stable, although it could be considered slightly up if not for the abundance of the less desirable low rabbitbrush. Trend for herbaceous understory is considered stable because the perennial grass component went slightly up and the grasses contribute to about 97% of the herbaceous understory cover. Sum of nested frequency for perennial forbs actually dropped dramatically, yet they contribute little to herbaceous cover. The Desirable Components Index (see methods) rated this site as fair with a score of 60 due to fair shrub cover, several young shrubs, and moderate decadency. Grass cover is good, but forb cover is almost nonexistent.

TREND ASSESSMENT
soil - stable (3)
browse - stable (3)
herbaceous understory - stable (3)
winter range condition (DC Index) - 60 (fair) Mountain big sagebrush type

1999 TREND ASSESSMENT

Trend for soil is stable with similar “relative percent” cover estimates for bare ground and litter. There is some localized erosion occurring between the contour furrows, but the treatment keeps erosion to a minimum. Trend for browse is also stable. Density of mountain big sagebrush has increased slightly and the proportion of young plants has increased. Percent decadence has remained stable although utilization is currently very heavy with 74% of the sagebrush sampled displaying heavy use. The population of the less desirable stickyleaf low rabbitbrush has increased slightly. It currently provides 56% of the shrub cover. The population is mostly mature (93%). Trend for the herbaceous understory is stable. Sum of nested frequency of perennial grasses has declined slightly, while nested frequency of the dominant crested wheatgrass has increased slightly. Both Indian ricegrass and needle-and-thread declined significantly in nested frequency. Forbs are rare and unimportant on this site. Nested frequency and cover for forbs has remained similar to 1994 levels. The Desirable Components Index rated this site as fair with a score of 58 due to an increase in shrub cover, several young shrubs, and moderate decadency. Grass cover is decreased slightly and forb cover is still almost nonexistent.

TREND ASSESSMENT
soil - stable (3)
browse - stable (3)
herbaceous understory - stable (3)
winter range condition (DC Index) - 58 (fair) Mountain big sagebrush type

2004 TREND ASSESSMENT

Trend for soils is stable. Protective cover (vegetation, litter, and cryptograms) combined has increased, but rock and pavement cover has increased suggesting that some erosion is still occurring. Trend for browse is stable. Mature big sagebrush density have increased from 3,160 plants/acre in 1999 to 7,540 plants/acre in 2004. It is currently 60% of the shrub cover, which is now greater than stickyleaf low rabbitbrush cover. Percent decadence is low at 10% and the proportion of young plants are enough to compensate for those that

are dying. In addition, seedling production was fairly abundant this year. The population of the less desirable stickyleaf low rabbitbrush has remained fairly stable. It provides 29% of the shrub cover, which is a decrease from 56% in 1999. Trend for herbaceous understory is slightly down. Native grasses such was Indian rice grass and needle-and-thread, and bottlebrush squirreltail continue to decline with the associated drought. They currently provide only 4% of the grass cover. Crested wheatgrass continues to dominate the understory. Forbs are rare and unimportant on this site. Nested frequency and cover did increase for longleaf phlox. The Desirable Components Index rated this site as fair with a score of 58 due to an increase in shrub cover, large decrease in young shrubs, and low decadency. Grass cover is decreased slightly and forb cover increased.

TREND ASSESSMENT
soil - stable (3)
browse - stable (3)
herbaceous understory - down slightly (2)
winter range condition (DC Index) - 58 (fair) Mountain big sagebrush type

HERBACEOUS TRENDS --
Management unit 16C, Study no: 23

Type	Species	Nested Frequency				Average Cover %		
		'88	'94	'99	'04	'94	'99	'04
G	Agropyron cristatum	256	234	245	232	7.96	6.82	9.41
G	Agropyron intermedium	b63	a4	a8	a8	.03	.07	.10
G	Agropyron spicatum	6	6	16	2	.16	.45	.06
G	Bouteloua gracilis	a-	b31	b27	b25	.90	.93	.61
G	Oryzopsis hymenoides	b51	c77	a20	ab29	1.24	.33	.22
G	Sitanion hystrix	a17	a29	b49	a11	.30	.55	.04
G	Sporobolus cryptandrus	-	1	4	1	.03	.01	.00
G	Stipa comata	ab50	b78	ab48	a33	2.33	.71	.24
Total for Annual Grasses		0	0	0	0	0	0	0
Total for Perennial Grasses		443	460	417	341	12.97	9.90	10.69
Total for Grasses		443	460	417	341	12.97	9.90	10.69
F	Arabis spp.	-	-	-	4	-	-	.03
F	Astragalus calycosus	b19	a2	ab7	b27	.01	.03	.06
F	Calochortus nuttallii	3	-	1	-	-	.00	-
F	Chenopodium leptophyllum(a)	-	a6	a-	b58	.01	-	.18
F	Descurainia pinnata (a)	-	-	-	-	-	-	.00
F	Erigeron pumilus	b21	a-	ab8	a4	-	.07	.01
F	Lappula occidentalis (a)	-	-	-	8	-	-	.02
F	Machaeranthera canescens	b37	a4	a3	a7	.01	.06	.02
F	Microsteris gracilis (a)	-	-	3	4	-	.00	.01
F	Phlox longifolia	c164	b50	a17	c142	.15	.06	.78
F	Senecio multilobatus	1	-	-	-	-	-	-
F	Sphaeralcea coccinea	66	44	45	64	.24	.22	.68

Type	Species	Nested Frequency				Average Cover %		
		'88	'94	'99	'04	'94	'99	'04
F	Unknown forb-perennial	1	-	-	-	-	-	-
Total for Annual Forbs		0	6	3	70	0.01	0.00	0.22
Total for Perennial Forbs		312	100	81	248	0.41	0.45	1.60
Total for Forbs		312	106	84	318	0.42	0.46	1.83

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --
Management unit 16C, Study no: 23

Type	Species	Strip Frequency			Average Cover %		
		'94	'99	'04	'94	'99	'04
B	Artemisia tridentata vaseyana	95	96	94	5.84	7.78	12.13
B	Ceratoides lanata	17	16	18	.09	.12	.28
B	Chrysothamnus viscidiflorus viscidiflorus	95	92	93	7.64	10.25	7.76
B	Opuntia spp.	7	13	12	.04	.01	.01
B	Sclerocactus	0	0	1	-	-	-
Total for Browse		214	217	218	13.62	18.17	20.19

CANOPY COVER, LINE INTERCEPT --
Management unit 16C, Study no: 23

Species	Percent Cover '04
Artemisia tridentata vaseyana	12.58
Ceratoides lanata	.13
Chrysothamnus viscidiflorus viscidiflorus	5.90
Opuntia spp.	.03
Pinus edulis	.06

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 16C, Study no: 23

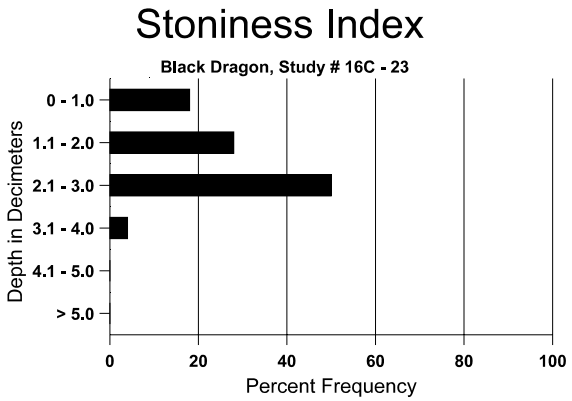
Species	Average leader growth (in) '04
Artemisia tridentata vaseyana	1.6

BASIC COVER --
Management unit 16C, Study no: 23

Cover Type	Average Cover %			
	'88	'94	'99	'04
Vegetation	6.75	24.96	27.18	31.84
Rock	.75	4.69	.76	1.27
Pavement	10.00	.74	7.55	7.59
Litter	37.25	19.30	17.26	23.89
Cryptogams	1.00	.08	.11	1.31
Bare Ground	44.25	37.02	40.47	45.37

SOIL ANALYSIS DATA --
Management unit 16C, Study no: 23, Study Name: Black Dragon

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	ds/m
11.4	60.7 (12.6)	7.1	57.4	16.7	25.8	1.7	6.9	60.8	0.7



PELLET GROUP DATA --
Management unit 16C, Study no: 23

Type	Quadrat Frequency		
	'94	'99	'04
Rabbit	36	14	31
Elk	29	44	41
Deer	38	22	23
Cattle	4	2	2

Days use per acre (ha)	
'99	'04
-	-
53 (131)	50 (124)
40 (99)	17 (43)
10 (25)	11 (27)

BROWSE CHARACTERISTICS --
Management unit 16C, Study no: 23

		Age class distribution (plants per acre)					Utilization					
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
Artemisia nova												
88	**199**	-	66	133	-	-	0	0	-	-	33	6/15
94	**0**	-	-	-	-	-	0	0	-	-	0	-/-
99	**0**	-	-	-	-	-	0	0	-	-	0	-/-
04	**0**	-	-	-	-	-	0	0	-	-	0	-/-
Artemisia tridentata vaseyana												
88	**49799**	4333	44600	2266	2933	-	3	6	6	.20	1	8/12
94	**9040**	-	2540	5040	1460	320	19	.66	16	7	7	9/18
99	**10180**	320	5460	3160	1560	640	18	74	15	3	4	11/22
04	**8900**	3760	440	7540	920	1220	59	14	10	4	6	12/19
Ceratoides lanata												
88	**1466**	-	200	1266	-	-	36	59	-	-	0	4/3
94	**520**	-	40	480	-	-	19	0	-	-	0	3/4
99	**620**	-	20	600	-	-	74	13	-	-	0	7/7
04	**580**	20	60	520	-	-	7	83	-	-	0	6/7
Chrysothamnus viscidiflorus viscidiflorus												
88	**13933**	1933	11733	2200	-	-	1	0	0	-	0	5/8
94	**18780**	-	2240	16500	40	-	0	0	0	-	0	4/9
99	**19680**	80	1280	18400	-	20	7	.20	0	-	0	6/12
04	**6520**	820	100	6140	280	1220	.61	0	4	3	3	5/9
Opuntia spp.												
88	**999**	133	533	400	66	-	0	0	7	2	27	3/7
94	**140**	-	-	140	-	-	0	0	0	-	0	3/6
99	**300**	-	40	240	20	-	0	0	7	7	7	3/14
04	**260**	20	60	180	20	20	0	0	8	8	8	2/9
Pinus edulis												
88	**0**	-	-	-	-	-	0	0	-	-	0	-/-
94	**0**	-	-	-	-	-	0	0	-	-	0	-/-
99	**0**	-	-	-	-	-	0	0	-	-	0	-/-
04	**0**	20	-	-	-	-	0	0	-	-	0	-/-
Sclerocactus												
88	**0**	-	-	-	-	-	0	0	-	-	0	-/-
94	**0**	-	-	-	-	-	0	0	-	-	0	-/-
99	**0**	-	-	-	-	-	0	0	-	-	0	-/-
04	**20**	-	-	20	-	-	0	0	-	-	0	-/-